



Installation of Pre-Planted Pallets via Helicopter to Restore Inaccessible Reed Canary Grass Dominated Wetlands

Presented By

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Tulalip Tribes of WA

Successors in interest to the Snohomish, Snoqualmie, Skykomish, and other tribes and bands signatory to the 1855 Treaty of Point Elliott.



Reed Canarygrass

- Invasive perennial rhizomatous grass
- Often creates large single-species stands in wetlands, floodplains, and riparian areas
- Established stands reduce habitat quality and value
 - Decrease water quality
 - Increase local flooding
 - Decrease fish passage
- Difficult to eradicate existing stands
 - Shading generally considered the best long-term control strategy



Project Overview

- Demonstration project funded by EPA WPDG
- Determine if pre-planted pallets can be installed in a RCG-dominated wetland
- Install 120 pre-planted pallets and equivalent-sized willow live stake and control plots
- Could be used in a variety of settings





Project Permitting

- **US Army Corps of Engineers:** Nationwide Permit #18 (Minor Discharges)
 - Fish Passage & Restoration Programmatic (FPRP) consultation for §7
- **WA Dept. of Fish & Wildlife:** HPA through the Habitat Recovery Pilot Program (HRPP) process
- **WA Dept. of Ecology:** met ECY's NWP #18 programmatic decision
- **Snohomish County:** Flood Hazard Permit





Study System





Study System





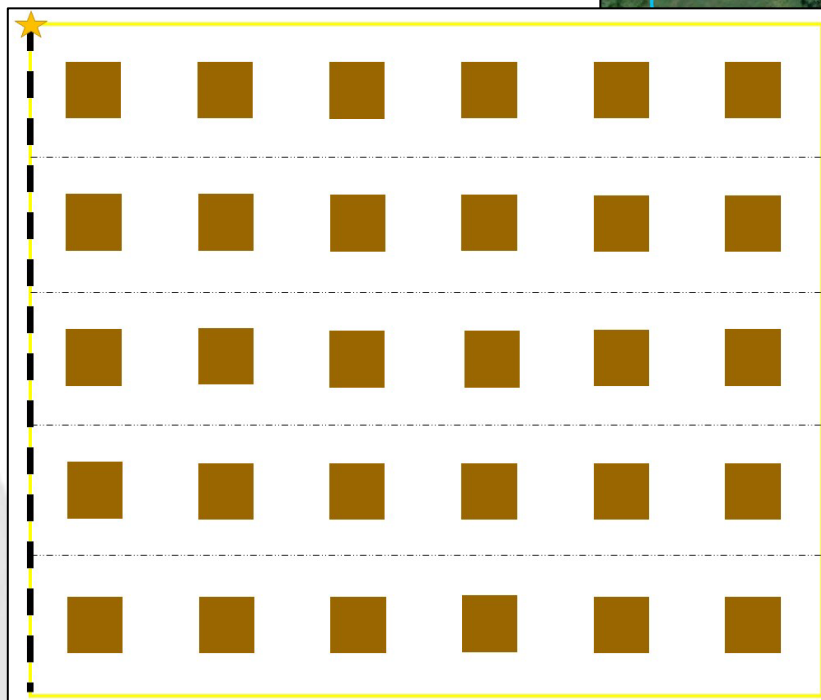
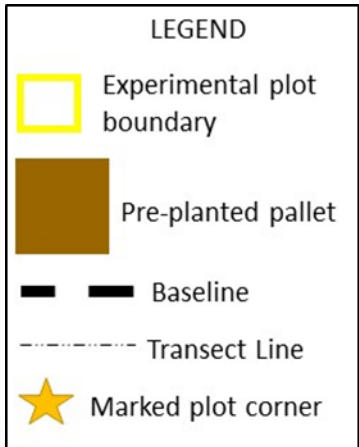
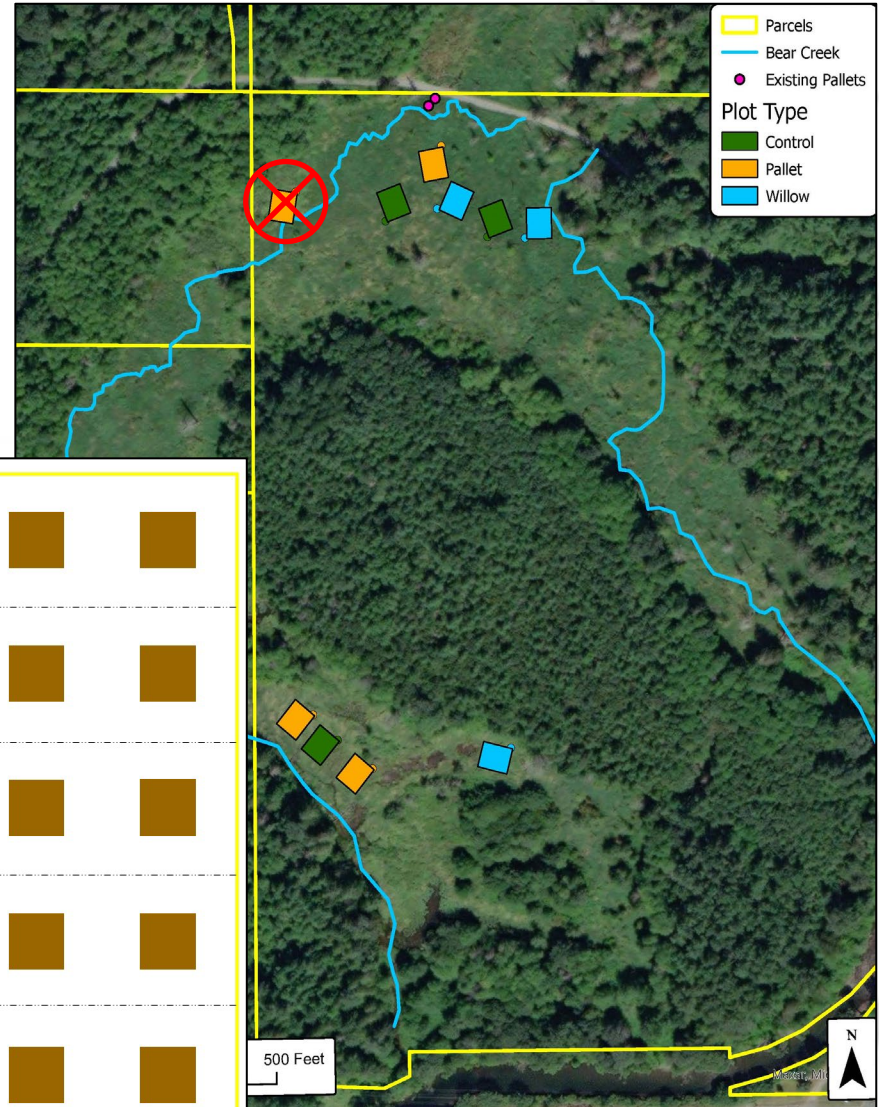
Study System





Study Design

- 9 50'x60' plots
- 3 Pallet Plots
- 3 Willow Plots
- 3 Control Plots





Baseline Conditions

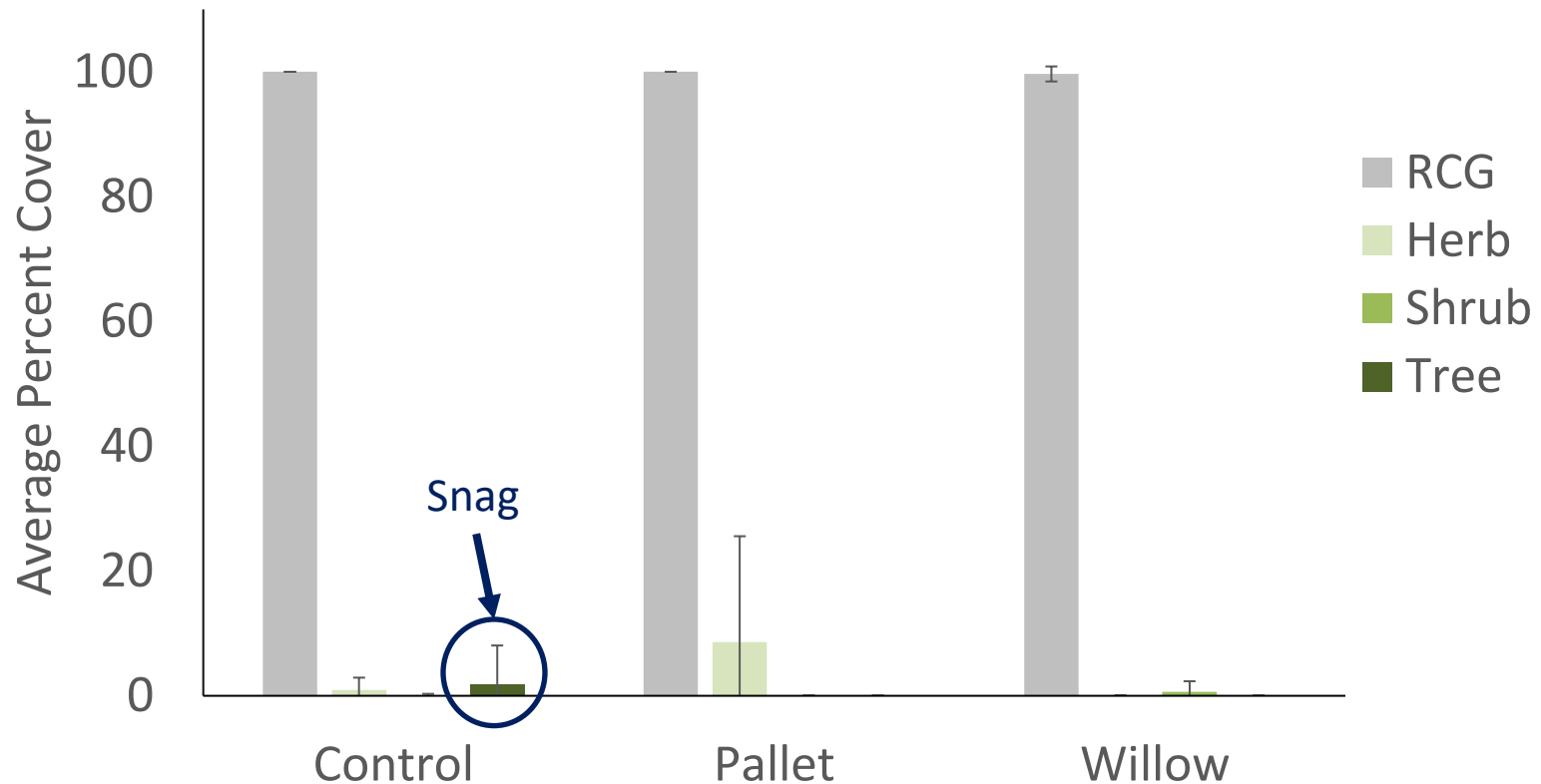
► Collected data in July 2023





Baseline Conditions

- 95-100% RCG for every transect
- Some sparse bittersweet nightshade, red twig dogwood, Sitka willow, and snag cover along transects





Pallet Plot Design



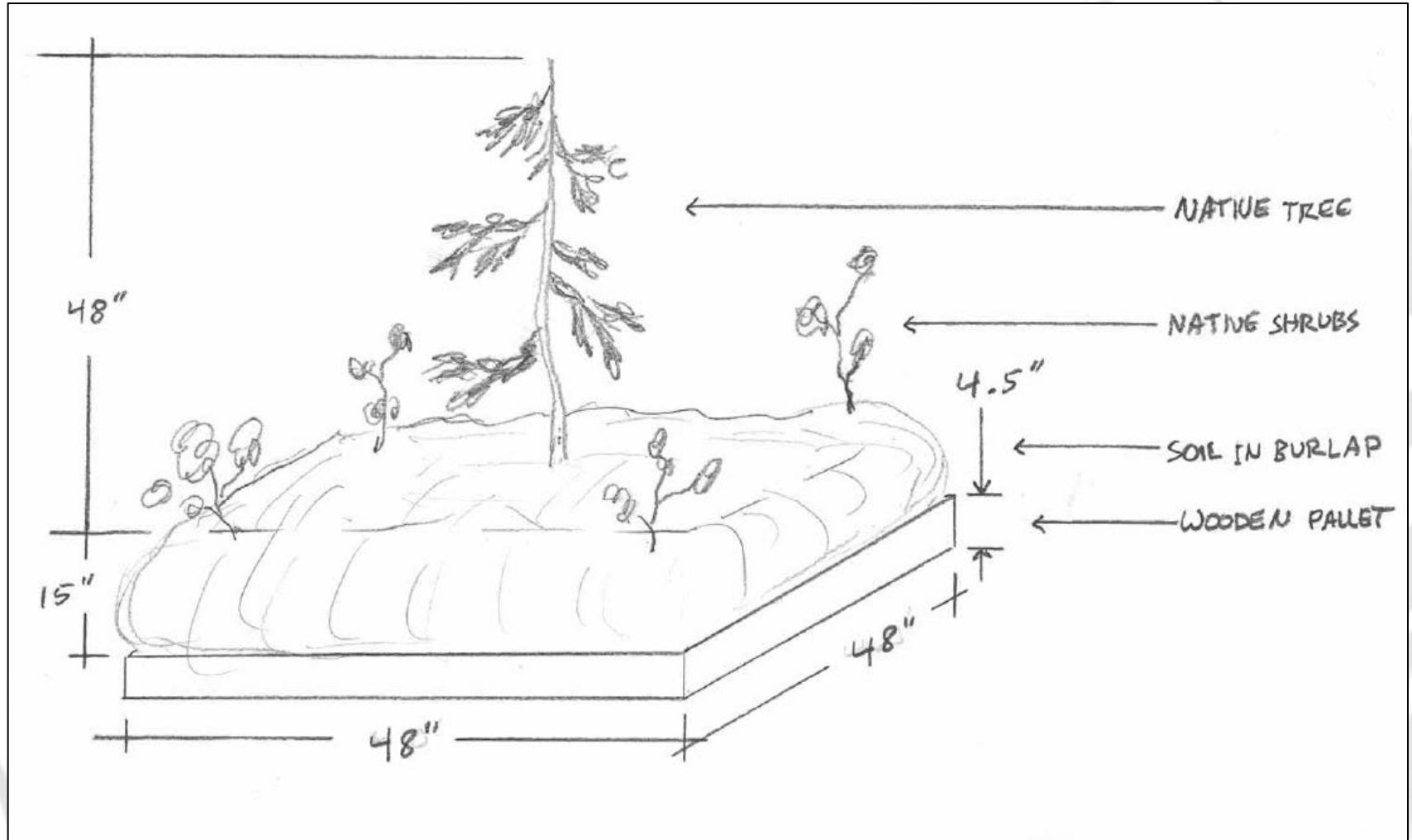
This is a Perspective View. Scale changes with depth.

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Pre-Planted Pallet Design





Pallet Construction

- 48"x40" wood pallet (heat-treated only)
- Degradable landscaping stakes
- Wetland-appropriate soil
- 8'x10' burlap sheet
- 2 12' lengths $\frac{3}{4}$ " manila rope





Pallet Planting

- Trees (5-gal) - 1 per pallet
 - 100 Sitka spruce
 - 20 Western red cedar
- Shrubs (2-gal) - 4 per pallet
 - 120 red twig dogwood
 - 120 ninebark
 - 120 cluster rose
 - 120 twinberry





Pallet Installation

- We flew pallets one by one (~0.75 miles away)
- Round trip in 3-4 minutes.
- We did not need to fly over any roads or buildings/structures.





Willow Plots

- 350 willow live stakes per plot
 - Hooker willows
 - Pacific willows
 - Sitka willows





Control Plots

➤ No treatment





Costs

Pre-Planted Pallets

- ~\$332/pallet or ~\$9,519/plot
- 352 people hours

Willow Live Stakes

- ~\$2.40/live stake or ~\$841.70/plot
- 30 people hours

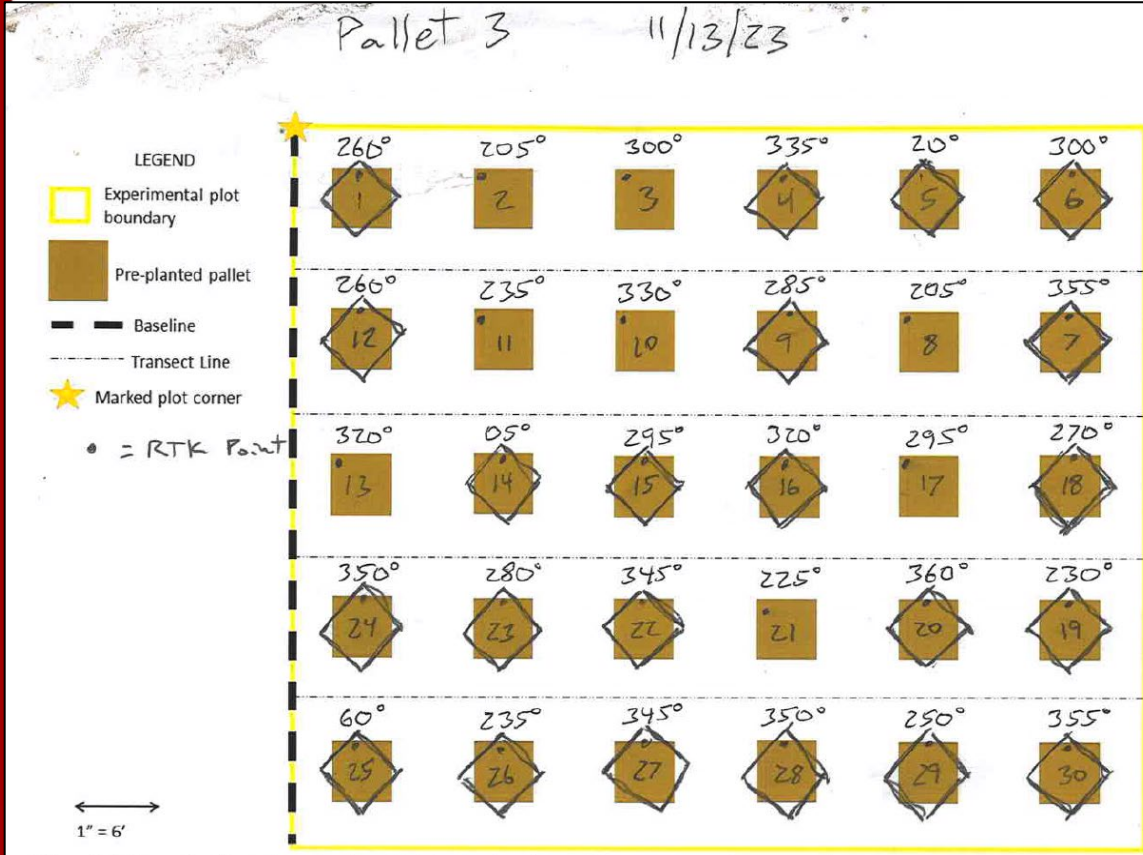
Control Plots

- \$0



As-Built

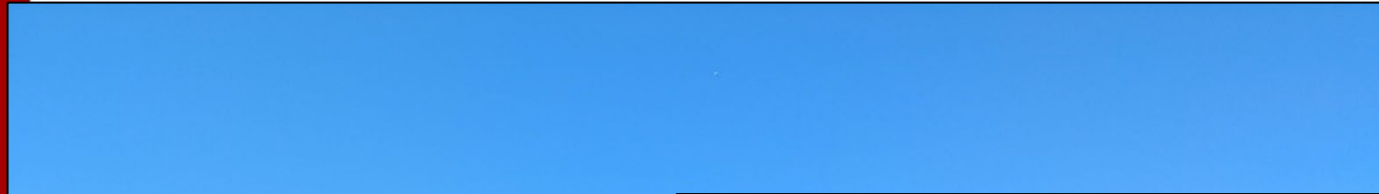
- GPSed pallets
- Recorded plants on each pallet





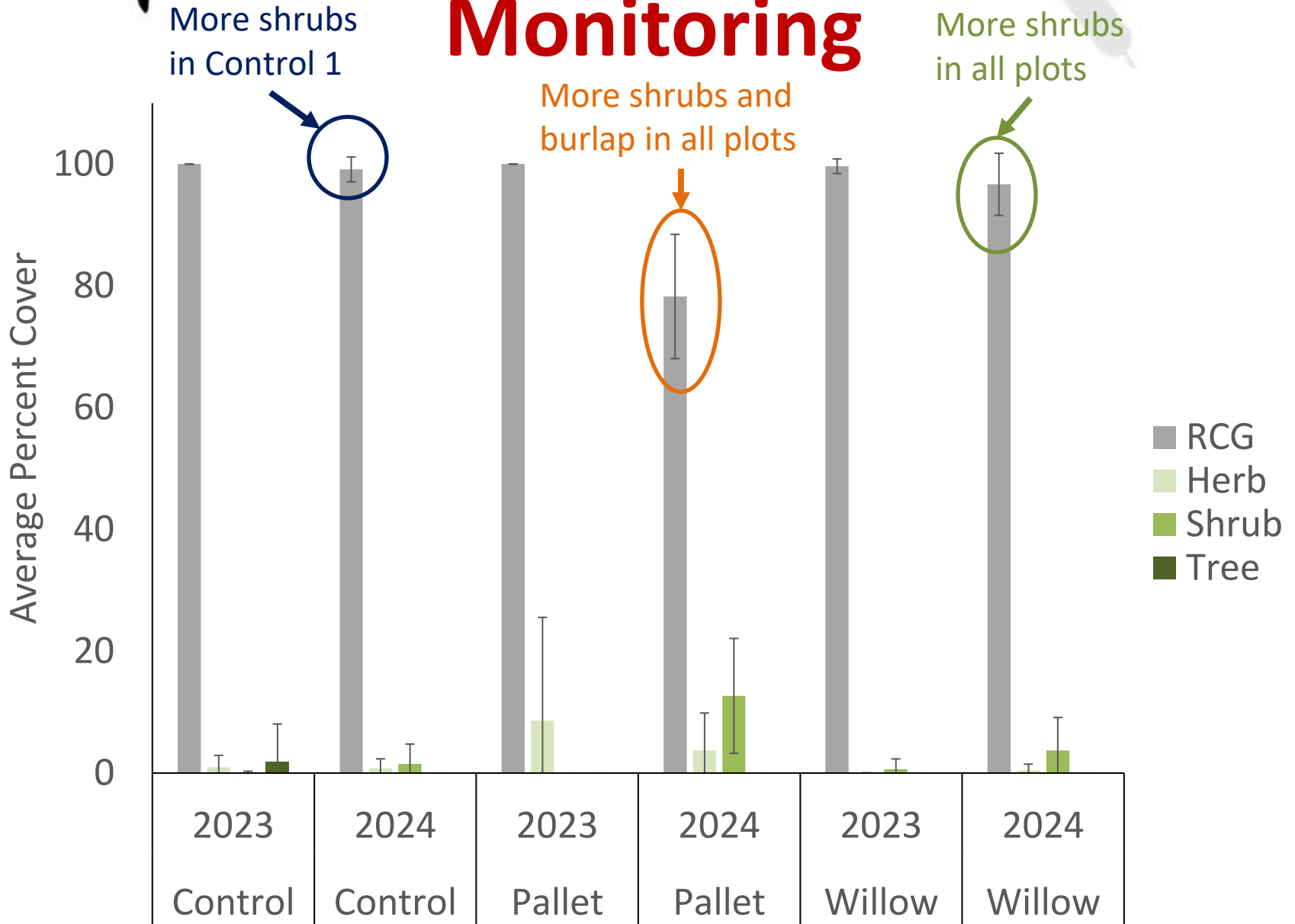
Year 0 Monitoring

➔ May 2 and June 26, 2024





Monitoring





Year 0 Monitoring

➤ Beavers, Deer, and Bears! Oh my!





tig^wicid! (Thank you!)

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